

Targeting Cardiovascular Vulnerabilities in Women with HIV on ART: A Quality Improvement Initiative

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Abstract

While antiretroviral therapy (ART) has improved survival in women with HIV, it also increases cardiovascular disease (CVD) risk due to overlapping hormonal, metabolic, and inflammatory factors. This systematic review identifies key contributors to CVD vulnerability—including traditional, HIV-related, sex-specific, and social determinants—to inform a targeted patient survey aimed at enhancing risk assessment, individualized care, and prevention strategies.

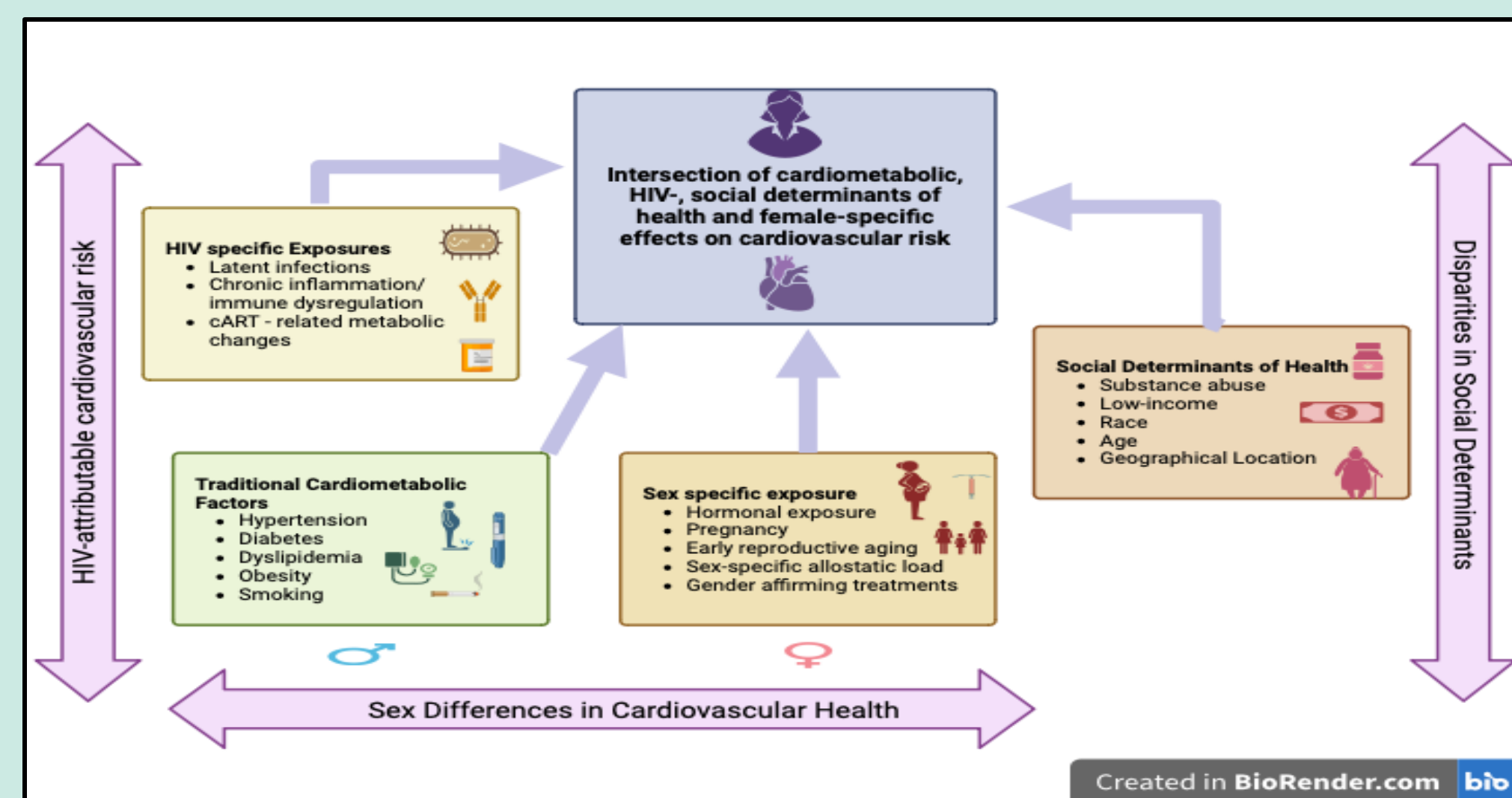


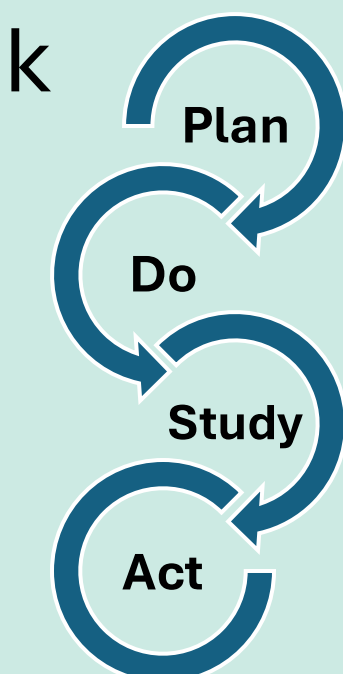
Figure 1 : Intersecting Risk Pathways for Cardiovascular Disease Among Women with HIV (WWH)^[6]- Kentoffio et al 2022, *Curr Opin HIV AIDS* 2022. Image Created with BioRender.com

Introduction

- ❖ While ART has improved HIV survival, it is associated with higher cardiovascular disease (CVD) risk, especially in women who already face additional CVD risk due to hormonal, metabolic, and immune factors^[1,2].
- ❖ ART can promote atherosclerosis and insulin resistance, increasing CVD vulnerability^[1,2,3].
- ❖ Socioeconomic and healthcare access challenges exacerbate CVD risks in women on ART^[4,5].

Objective

- ❖ Identify key contributors to cardiovascular risk in women with HIV on ART.
- ❖ Develop a targeted survey to assess risk and prevention gaps.
- ❖ Use findings to guide a future **Plan-Do-Study-Act (PDSA) cycle** aimed at improving risk screening and prevention strategies.



Methodology

Study Strategy, Selection and Curation:

Table 1: Databases searched and their correlated number of results using a specific keyword string

Database Searched	Date of search	Key word String	Filters applied	Number of Results
Pubmed	5/24/24	antiretroviral therapy AND cardiovascular AND HIV patient	1. 2010- 2024 2. English Language only. 3. Articles available through Rowan-Virtua SOM's Hope Brings Strength Digital Library	16
		antiretroviral therapy and cardiovascular and women		20
Clinical Key	5/24/24	antiretroviral therapy AND cardiovascular AND women	4. Clinical Trial, analysis, meta-analysis, RCTs, review and systematic review	15
CINAHL	5/25/24	antiretroviral therapy AND cardiovascular disease or cvd or heart or cardiac or coronary heart disease AND female or women or woman or females		12
Scopus	5/26/24	antiretroviral AND women AND cardiovascular		3
Embase	5/27/24	antiretroviral AND women AND cardiovascular		30
Web of Science	5/28/24	antiretroviral and women and cardiovascular		3
Total Number of Studies				99

Data Extraction: Self-created figures visually represent key findings from extracted study data without further analysis or comparison

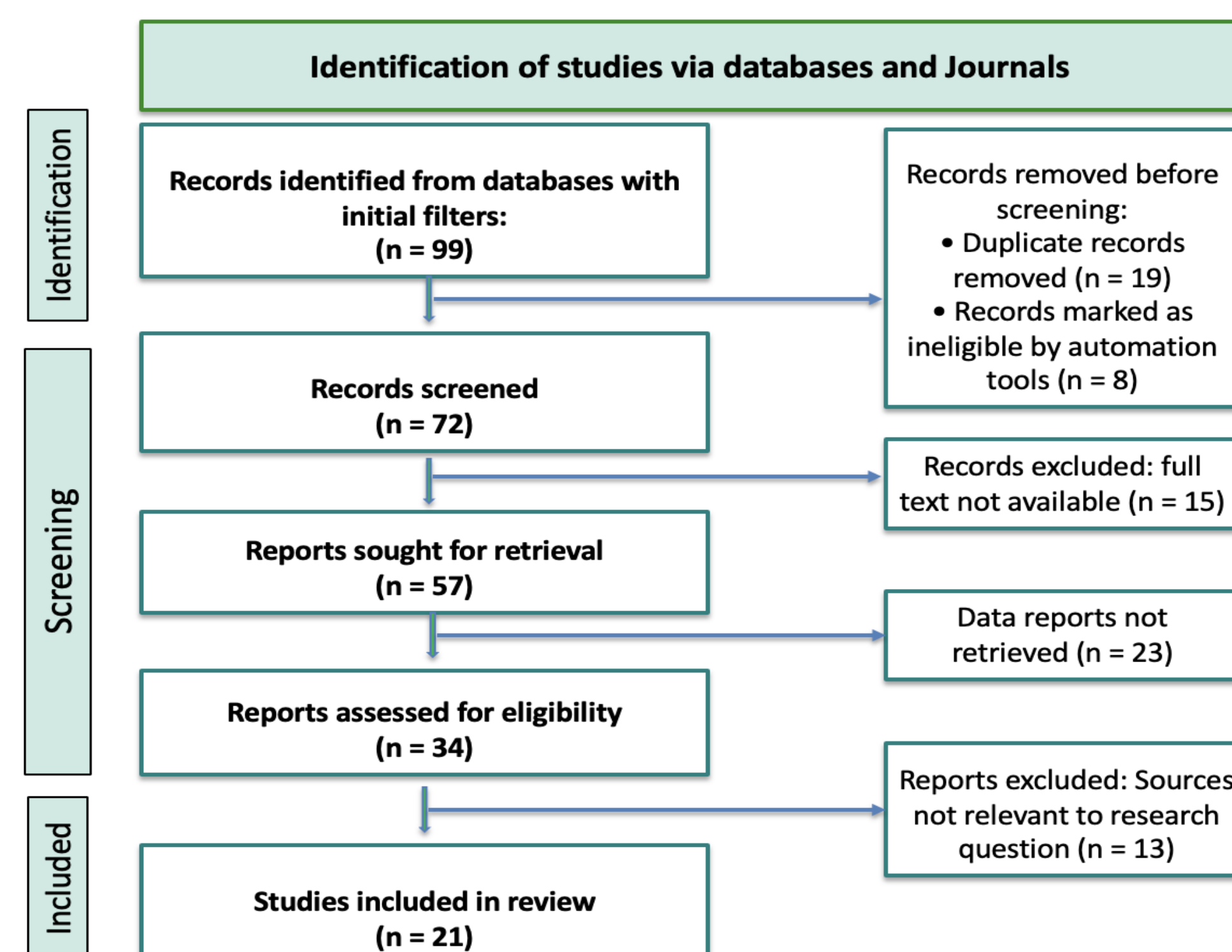


Figure 2: A PRISMA- based flow chart depicts the logic to choosing articles included in this report

Results

❖ A total of 21 studies were included in this review based on their analysis of specific cardiovascular risk factors in women with HIV on ART.

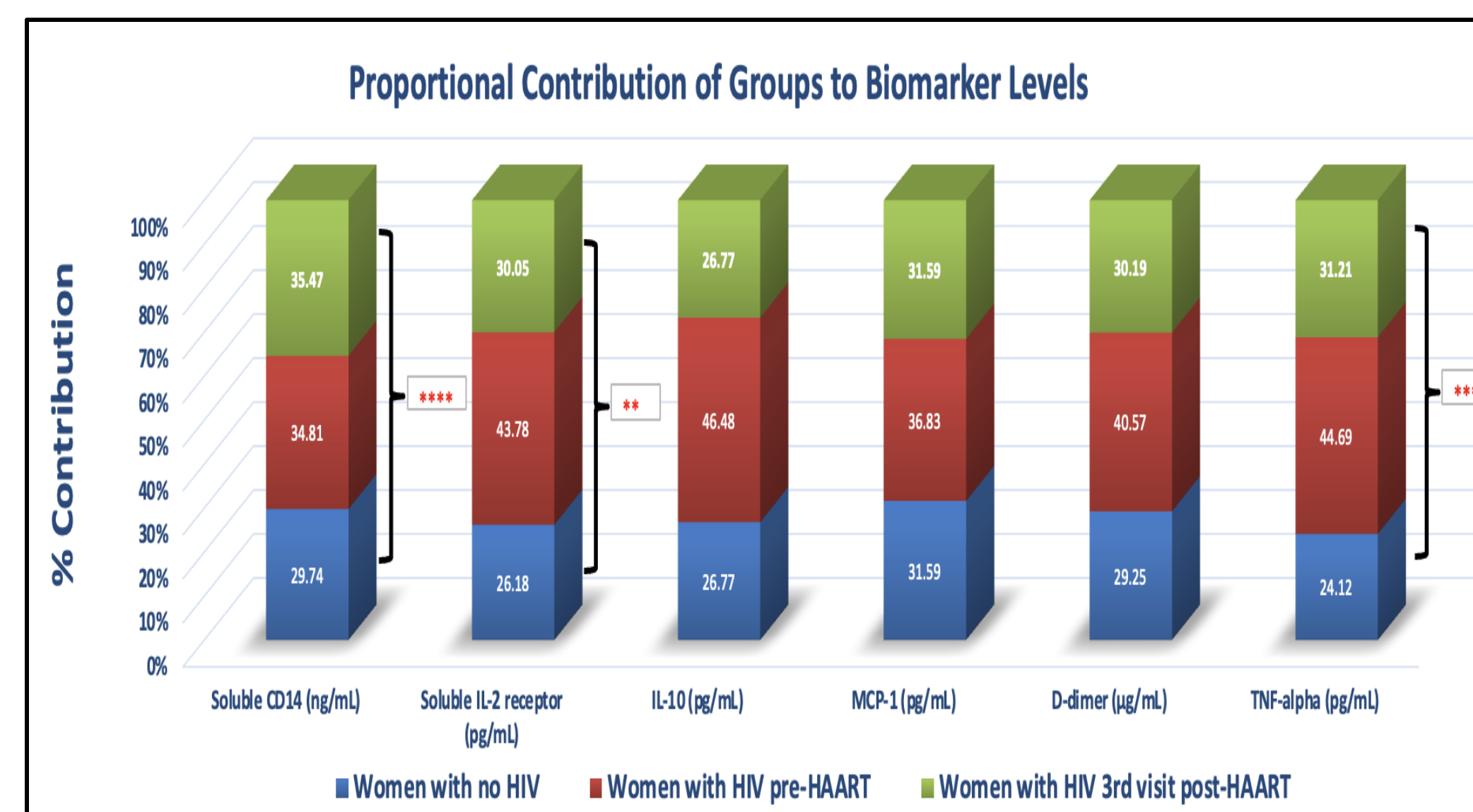


Figure 3 : Comparing levels of cardiovascular inflammatory biomarkers in women with no HIV, women with HIV pre-HAART and women with HIV after 3rd HAART. TNF-alpha remains significantly elevated in patient post HAART therapy. Data from Kaplan et al, 2012, *Pubmed*. (** = p<0.01). HAART = Highly Active Antiretroviral Therapy.

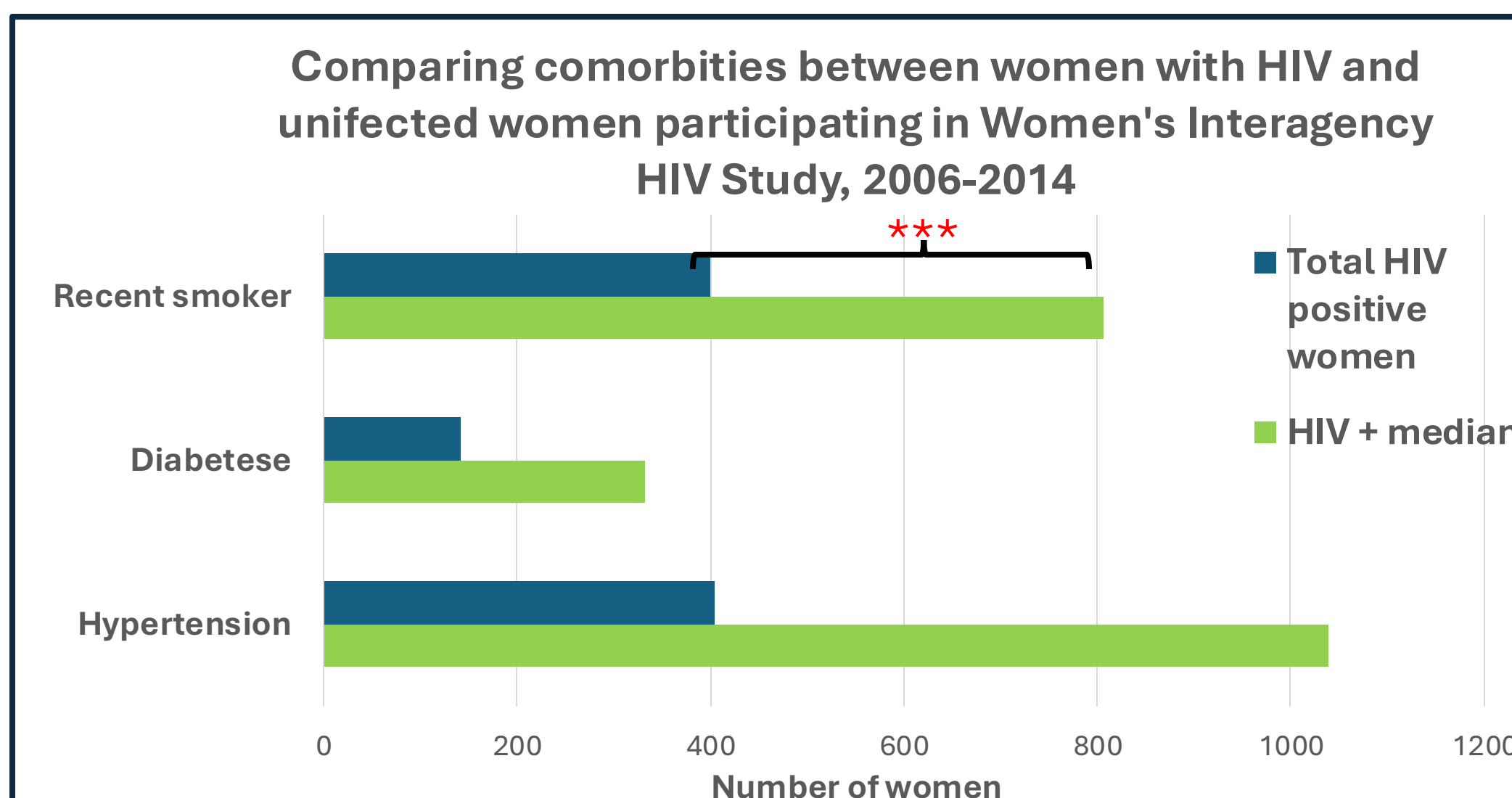


Figure 4 : Between 2006 and 2014, there were 1636 HIV+ and 683 HIV- women in the Women's Interagency HIV Study were evaluated for comorbidities hypertension, diabetes, or smoking status^[8]. Data from Hanna et al, 2016, *Pubmed*.

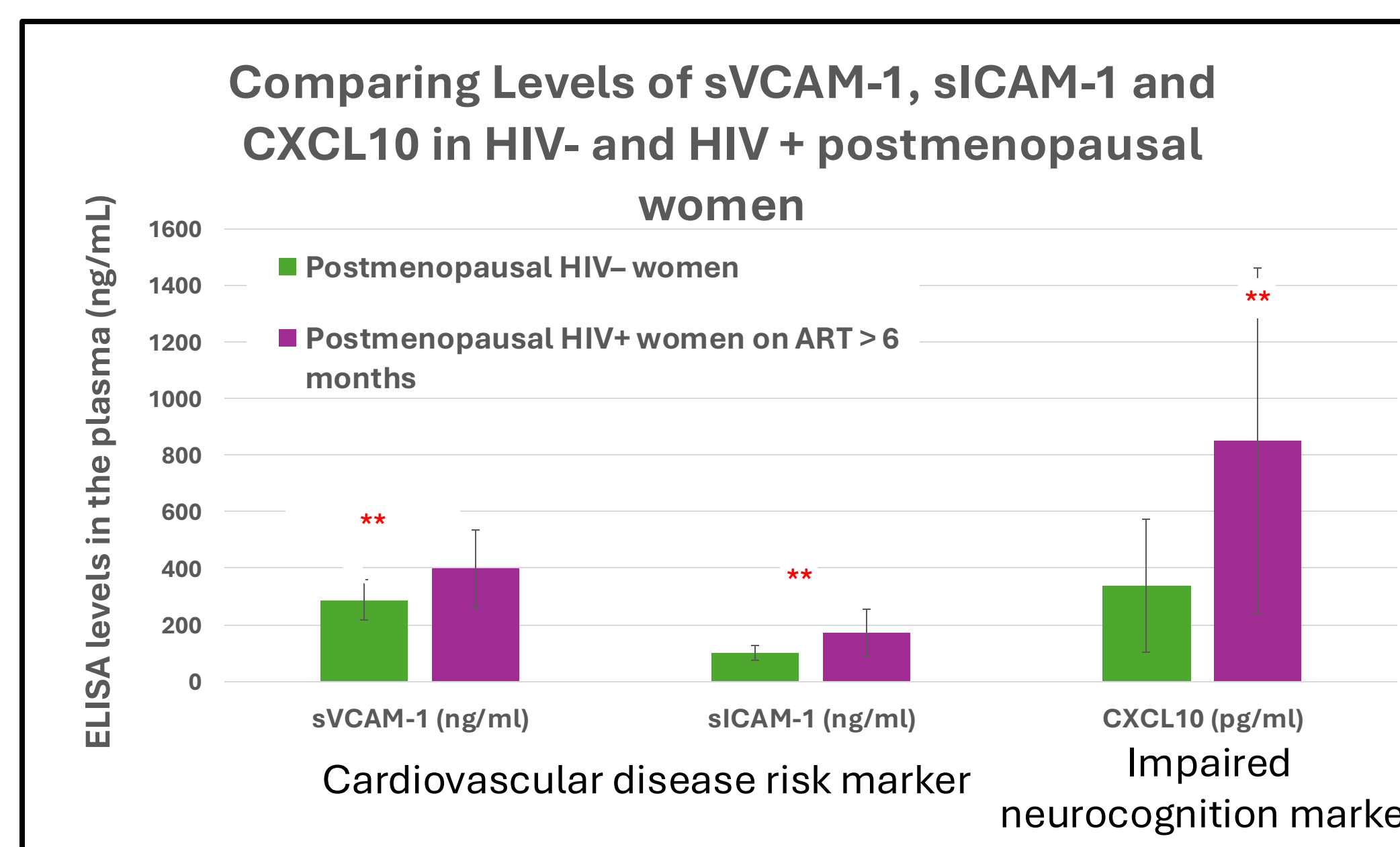


Figure 5 : Biomarkers of cardiovascular disease and impaired neurocognition are increased in HIV-infected post-menopausal women on Art for > 6 months^[9]. Data from Alcaide et al, 2014 *Pubmed*. (** = p<0.01)

Multi-component healthcare delivery

Multi-level ABCS (Aspirin, blood pressure, cholesterol, and smoking) Training

Managing cardiovascular risk in patients living with HIV on ART based on PRELUDE consortium

Blended, culturally-congruent, evidence-informed, psychoeducational, trauma-focused care model

Multilevel, dual prevention education and peer comparisons

Figure 6 : Intervention Models and Frameworks from the PRELUDE (Implementation REsearch to DEVELOP Interventions for People Living with HIV) Consortium. Data from Gamble-George et al 2020, *Pubmed*.

Key Takeaways

Disparities in Risk Factors

1. HIV+ women had higher prevalence of HTN, diabetes, smoking (WIHS)

2. Calls for tailored screening and prevention

Persistent Inflammation

1. Persistent inflammation despite ART: Inflammatory biomarkers (IL-10, TNF-α, sCD14) remained elevated in HIV+ women post HAART compared to HIV- controls

2. Postmenopausal HIV+ women showed ↑ sVCAM-1, sICAM-1, CXCL10

QI Strategy

1. Promote holistic care as recommended by PRELUDE consortium

2. Need for comprehensively tailored cardiovascular risk factor assessment (scan survey barcode)

3. Future PDSA cycle: integrate CVD screening into HIV clinic workflow

Conclusion

- ❖ Cardiovascular risk in women with HIV on ART is shaped by traditional, HIV-specific, sex-based, and social factors.
- ❖ Persistent inflammation, aging, and SDOH highlight the need for integrated, multidisciplinary management.
- ❖ Culturally tailored, peer-led models (e.g., PRELUDE) offer a promising path to close care gaps.
- ❖ Next steps: Pilot a 75-question comprehensive patient survey (QR code) in outpatient clinics to evaluate health outcomes and patient satisfaction (QI framework).

References

SURVEY

REFERENCES

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